conditions is disclosed, e.g., at page 5, lines 24-28. The use of conditions that result in chemical modification of cellulose is disclosed, e.g., at page 6, lines 14-19. No new matter is added.

Claims 1-6 have been rejected under 35 U.S.C. § 103(a) as unpatentable over Noguchi et al., WO 96/02632 (equivalent to U.S. Patent No. 5,658,765), in view of Glasser, U.S. Patent No. 5,430,142. The Examiner contends that Noguchi et al. discloses treating pulp with xylanase to produce xylose or xylooligosaccharide; that Glasser et al. discloses etherification of xylose or xylooligosaccharides; and that it would have been obvious to combine the teachings of these two references to achieve the presently claimed invention. This rejection is respectfully traversed.

The present invention is based on the finding that treatment of a cellulosic material (such as, e.g., wood pulp) with a *hemi*cellulase, followed by chemical treatment such as, e.g., etherification, results in cellulose derivatives exhibiting superior qualities (such as, e.g., improved filterability and decreased microgel formation).

Noguchi et al. merely discloses treatment of wood pulps with xylanase (a hemicellulase), but contains no hint or suggestion of chemically modifying the treated pulp so as to produce modified celluloses.

Glasser et al. relates to chemical modification of purified *xylans*. Glasser et al. specifically discloses purifying a pentosan-rich fraction *away* from a cellulosic fraction prior to chemical derivatization of the xylans (see, e.g., Figure 6; and col. 2, lines 59-68). Thus, Glasser et al. could provide one of ordinary skill in the art with no motivation to produce modified celluloses. In fact, Glasser et al. teaches away from the present invention by suggesting that the cellulosic fraction be discarded prior to chemical derivatization.

It is Applicants' position that the effect of hemicellulase treatment on the cellulosic fraction (as opposed to the hemicellulosic fraction) of pulp, e.g., in allowing the cellulosic components to be derivatized in a particular manner, could not have been predicted based on the prior art. Furthermore, it is believed that the unexpected benefits of the invention, e.g., celluloses exhibited an increased filterability and decreased microgel formation, are of sufficient magnitude to confer patentability on the present claims.

On the basis of the amendments and arguments, it is respectfully submitted that the present claims are non-obvious over the cited references and that this

rejection has been overcome.

The Examiner's attention is directed to an informal translation of the abstract of DE 4440245 C1, which is attached herewith on a separate sheet. It is not believed that this reference is material to patentability of the present claims, because it discloses only treatment of a pulp with cellulase. One of ordinary skill in the art would have had no motivation to substitute a cellulase with a hemicellulase in order to achieve an improved derivatization of cellulose.

In light of the above amendments and discussion, it is believed that the claims are in condition for allowance, and a determination to that effect is earnestly solicited.

Respectfully submitted,

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Method for preparation of cellulose ethers, having a degree of substitution DS<2, from cellulose and epoxy alkanes having from 2 to 4 carbon atoms, characterized in that

a) cellulose is pre-treated in an aqueous medium with 0.1 to 10% w/w cellulase (based on the amount of cellulose) at a temperature from 20 to 70 deg. C and a pH from 3 to 10,

b) separating the pre-treated cellulose from the aqueous medium, and

c) reacting the separated cellulose with from 1:0.5 to 1:10 molar amounts of the epoxy alkane in the presence of catalytic amount of quaternary ammonium base at a temperature from 20 to 90 deg. C to form the cellulose ether.

The method avoids the preparation of alkali cellulose and provides cellulose ethers which, due to a low degree of substitution, are thermoplastic and biological degradable.